Case Report

Isolated Oculomotor Cranial Nerve Palsy as Unusual Presentation of Primary High-Grade Burkitt's Cell Lymphoma in HIV Patient: Case Report and Literature Review

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Keywords

Oculomotor · Third cranial nerve · B-cell · Lymphoma · Burkitt's

Abstract

Burkitt lymphoma (BL) is a highly aggressive B-cell neoplasm that is well known to be associated with HIV. The presentation usually reflects the underlying immunodeficiency state (like opportunistic infections and chronic diarrhea, and enlarged lymph nodes). The most common causes for 3rd cranial nerve palsy are intracranial aneurysm, ischemia, trauma, and migraine. But for our case, it turned out to be associated with underlying HIV and BL, which is an unusual cause. Here, we present a 43-year-old gentleman with no past medical history presented to the emergency department with 4 days history of drooping of left eyelid and headache and binocular diplopia with no other neurological features. CT abdomen showed lymph node enlargement. Lymph node biopsy showed the characteristic of Burkitt's cell lymphoma. He was started on chemotherapy, but unfortunately, he died. We're enlightening this case of an isolated oculomotor nerve palsy to diagnose lethal pathology like disseminated BL.

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Introduction

HIV patients have a significantly increased risk of cancer, with approximately 25–40% of them developing a malignancy in their lives [1]. Ten percent developing non-Hodgkin lymphoma (NHL) expressly, from this Burkitt lymphoma (BL) represent approximately 25% of NHL in HIV patients [2].

BL is a highly aggressive B-cell neoplasm that can present in one of 3 distinct clinical forms: endemic, sporadic, and immunodeficiency associated. Although they have the same histological picture and similar clinical behavior, there are differences in epidemiology, clinical presentation, and genetic features between the 3 forms [3].

In general, patients with BL present with rapidly growing tumor masses and often have tumor lysis evidence. The endemic form, which is found in equatorial Africa, presents a jaw or facial bone tumor that spreads to extranodal sites. In contrast, the nonendemic (sporadic) form, seen in the USA and Western Europe, has an abdominal presentation, most often with the massive disease. Immunodeficiency-related cases more often involve lymph nodes [4].

The presentation of patients with immunodeficiency-related BL is often accompanied by signs or symptoms related to the underlying immunodeficiency (e.g., AIDS, congenital immunodeficiency, acquired immunodeficiency due to hematopoietic or solid organ transplantation). Immunodeficiency-related cases more often involve lymph nodes, bone marrow, and central nervous system (CNS) [5].

A third cranial nerve palsy can result from lesions anywhere along its path between the oculomotor nucleus in the midbrain and the orbit's extraocular muscles. The most common causes of 3rd cranial nerve palsy are intracranial aneurysm, ischemia, trauma, and migraine [6]. Here, we are reporting a middle-aged male case presented with isolated 3rd cranial nerve palsy, which turned to be associated with underline HIV infection, and BL, which is an unusual presentation for both.

Case Presentation

A 43-year-old gentleman with no past medical history presented to the emergency department with 4 days history of drooping of the left eyelid and headache and binocular diplopia (horizontal and vertical) with no other neurological symptoms. On examination, he had unequal pupils, left more prominent than the right (5 vs. 3 mm), abducted and down deviated left eye with complete ptosis, no facial asymmetry, preserved sensation over the face, no motor and sensory deficit. Seen by ophthalmology and confirmed left oculomotor palsy. Seen by neurology and requested a plain CT head and angiogram to rule out compression and posterior communicating aneurysm, both ruled out. Further evaluation was done by MRI head and orbit, which were unremarkable.

During the hospital course, he developed epigastric pain aggravated by food; the abdominal ultrasound was done for further evaluation and showed suspicion of bowel wall thickening. For further evaluation, CT abdomen was done and showed jejunal wall thickening and irregular outline with multiple enlarged lymph nodes seen in the bilateral inguinal.

CT chest was requested to look for mediastinal lymph node and showed a large filling defect present in the right atrium extended into the upper end of the inferior vena cava, findings suggestive of lymphoma. Further evaluation was requested based on the above findings and include: ECHO and cardiac MRI showed an intracardiac mass consistent with lymphoma. Lymph node biopsy was done (see Fig. 1–5), which showed features consistent with BL.

Fig. 1. Showed dermis is infiltrated by sheets of intermediate-sized lymphocytes.

Fig. 2. Showed CD20 immunohistochemical stain is positive.

Fig. 3. Showed the tumor cells are positive for CD10 immunohistochemical stain.

He was shifted to a hematology/oncology hospital to receive chemotherapy; he initially received CHOP protocol (cyclophosphamide, doxorubicin, vincristine, and prednisolone). He received intrathecal methotrexate; initially, he showed a response, but unfortunately, he deteriorated and died.

Fig. 4. Neoplastic cells are positive for C-MYC.

Fig. 5. Showed in situ hybridization for EBER.

Discussion

NHL is a malignant disease that initiates in the lymphatic system and can spread to the CNS, recognized as secondary CNS lymphoma (SCNSL). Leptomeninges are most frequently involved in SCNSL and can manifest with cranial nerve involvement [7].

NHL metastasis that involves CNS frequently contributes to significant impairment with neurology and limited life expectancy. Approximately, 5–10% of systemic NHL patients will have SCNSL [8].

Neurolymphomatosis has been defined as the infiltration of peripheral nerves, nerve roots, and cranial nerves by lymphomatosis and frequently characterized by painful or painless polyneuropathy or mononeuropathy of the periphery [9].

Cranial nerve dysfunction may result from primary or secondary lymphoma, and the most common cranial nerve involved due to leptomeningeal disease is the facial nerve [10]. Ocular presentations of SCNSL are unusual and involve optic nerve lesions, nystagmus, ptosis, extraocular dysfunction, lagophthalmos, corneal reflex impairment, as well as other similar neurological symptoms, such as papilledema [11].

Dysfunction of the oculomotor nerve can occur due to lesions between the midbrain and the orbit anywhere along its path. The third cranial nerve has both motor and parasympathetic components. The most typical causes of isolated third cranial nerve palsy are diabetes mellitus, posterior communicating artery aneurysm, and uncal herniation [12]. The unusual

association between isolated third cranial nerve palsy and lymphoma was reported only in 22 cases upon literature review.

In 18 cases, the types of cells were described, and the most common phenotypes were large B-cell lymphoma [13]. BL was reported in only 4 of these cases (3 of them had HIV or immunosuppression-related lymphoma while only one case occurred in the immunocompetent patient). There was only one instance of oculomotor nerve paralysis due to Hodgkin's lymphoma [14].

Some authors documented similar cranial neuropathies associated with lymphomas in the CNS, but these neurological lymphomas are also associated with other clinical features of lymphomas (namely B-symptoms) or lymphadenopathy [15]. Usually, other patients with lymphoma have supporting results that favor lymphoma diagnosis, such as a rise in leukocyte count and mediastinal masses, lymphadenopathy which was absent in our case, that mask the diagnosis of lymphoma initially [16].

This case is unusual because of the presence of isolated third cranial nerve paralysis without any other physical exam or a lab test that could lead us towards a proper conclusion on the diagnosis. In this scenario, establishing an accurate diagnosis is critical to guide the management strategy for high-grade B-cell lymphoma.

Method of Literature Review

For the years 1966–2020, we searched the MEDLINE database from the PubMed website, using the main terms lymphoma, third nerve palsy, HIV, and leptomeningeal disease neurolymphomatosis, and AIDS. Further papers were derived from the retrieved articles through an analysis of the reference list. Non-English publications in literature have not been reviewed.

Conclusion

Isolated third cranial nerve palsy can be only the sign that leads to critical illness like BL. In the absence of other causes of isolated oculomotor palsy, keep an open mind to such a rare association between BL and third cranial nerve palsy because time management is crucial in establishing the correct diagnosis and starting management.

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Statement of Ethics

This case was approved by the Hamad Medical Corporation's Medical Research Center, written informed consent was obtained from the patient and his family for publication of this case report and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest

Author Contributions

Elabbass A. Abdelmahmoud: writing, editing, and literature review. Mohammed Abdulgayoom: writing and literature review. Mohammed Elhadi: writing and editing. Hiba Magboul: writing and editing. M.Z. Sharaf Eldean: imaging review. Sali Alatasi: imaging review.

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